ANADROMOUS FISH SUPPLEMENTARY INFORMATION

This Anadromous Fish Supplementary Information (April 2002) amends the Watershed Characteristics Report (February 2001). This Supplementary Information (1) replaces a statement on the implications of genetic testing for determining geographic origins of Chinook salmon with excerpts from two relevant scientific reports, (2) adds excerpts from documentary references and oral statements concerning the historical occurrence of Chinook salmon in Santa Clara streams, and (3) amends a table that summarizes occurrence of freshwater fish in local streams, by adding a clarifying footnote on the uncertainty of origins of chum salmon.

Statement on Genetic Testing

The following statement, which appears in the Watershed Characteristics Report, (page 7-68 and pages 7-131 through 132), is hereby deleted due to disagreement between WMI members regarding the interpretation of current genetic testing information:

> *"Although genetic testing suggests that some of these adult Chinook are of Central Valley hatchery origin, an unknown portion of the adult Chinook run may be from local wild production (Federal Register 1999; Neilsen 1995; Neilsen at al 1999)."*

Though WMI members agree that Chinook salmon are present in the Guadalupe River, they disagree whether the current population of Chinook salmon is a remnant of a historical wild run, a run populated by strays from Central Valley hatcheries, or a mixture of the two. There is also disagreement about the degree to which previously conducted genetic testing can be used together with other data to determine the origin of this population. WMI members hope that further research will help resolve these disagreements.

The deleted quote is replaced with excerpts below from: (1) "Salmon from the Sacramento-San Joaquin Basin and Guadalupe River 1992-1994", by Dr. Jennifer L. Nielsen, USDA Forest Service (1995), and (2) "Final Rule of National Marine Fisheries Service re: Endangered and Threatened Species; Threatened Status for Two Chinook Salmon Evolutionarily Significant Units (ESUs) in California," 64 Federal Register 50,393 (Sept 16, 1999). These excerpts do not interpret these documents or state a position on any findings made therein.

Excerpts from: "Salmon from the Sacramento-San Joaquin Basin and Guadalupe River 1992-1994", by Dr. Jennifer L. Nielsen, USDA Forest Service (1995):

"Fin tissue was collected by the California Department of Fish and Game (CDFG) and amplified for mtDNA from 455 chinook from 8 rivers and 5 hatchery stocks of the Sacramento-San Joaquin basin in Central Valley, CA (1992-94) and from 29 spawning chinook (1994) collected from the Guadalupe River, a southern tributary of San Francisco Bay." (page 2)

"Chinook from the Guadalupe River drainage that were collected by CDFG showed distinct haplotypes, not found in any Central Valley population (wild or hatchery). These unique genotypes appear to be distributed throughout the spawning run and not temporally distributed

into the early or late spawning population on the Guadalupe River. The genetic origins of these fish remain unknown, but they are definitively not hatchery strays based on the evidence available from the hatchery collections we have analyzed. It is, however, important to look further in the hatchery populations where these genotypes may be more temporally distributed before we exclude a hatchery origin for these fish." (pages 13-14)

"It is interesting that of the eight fish carrying unique mtDNA haplotypes (two haplotype #9s and six haplotype #11's) collected by CDFG in 1994, six were males and only two were females, suggesting the uneven sex ratio one expects to see in an opportunistic migration....The remaining fish collected from the Guadalupe River could not be differentiated from Chinook from the Merced and Feather River Hatcheries using the mtDNA locus." (page 14)

Excerpts from "Final Rule of National Marine Fisheries Service re: Endangered and Threatened Species; Threatened Status for Two Chinook Salmon Evolutionarily Significant Units (ESUs) in California," 64 Federal Register 50,393 (Sept 16, 1999):

"Microsatellite DNA variation has also been used in recent studies to examine genetic relationships among populations of chinook salmon in California. Nielsen et al. (1994) found significant heterogeneity among fall-run hatchery stocks and also among naturally spawning fall-run populations but there was no significant geographic structure at the basin level for wild fall-run chinook salmon. However, comparisons of wild fall-run carcasses and hatchery stocks suggest that naturally spawning fall-run fish in several basins retain some degree of genetic distinctiveness not found in hatcheries. Allele-frequencies for carcass collections made on the American, Tuolumne, Merced, and Feather Rivers were significantly different from samples of hatchery populations found within the same drainage. The Merced and Mokelumne Rivers were found to be most similar to hatchery populations on their respective rivers. The heterogeneity comparisons for some wild fall-run carcass collections may have been biased by small sample sizes. Fall-run hatchery populations were differentiated from populations of other run times but samples of wild fall-run populations were not compared to populations of winter, spring, or late-fall runs. Naturally spawning late fall-run fish were differentiated in allozyme analysis from all other populations including CNFH late fall-run salmon. The naturally spawning late fall-run population was most genetically similar to either winter-run fish or the CNFH late fall-run population, depending on the genetic distance measure used. Nei's measure of genetic distance indicated that late fall-run populations were most similar to hatchery fall-run populations.

Nielsen et al. (1994) and Nielsen (1995) examined mtDNA variation in 14 samples of chinook salmon from Central Valley rivers and hatcheries and one sample from the Guadalupe River, a southern tributary of San Francisco Bay. Nielsen et al. (1999) concluded that their data support their earlier conclusions (Nielsen et al., 1994) that fall, late-fall, spring, and winter runs of Central Valley chinook salmon show consistently significant differences for the mtDNA locus, indicating infrequent straying and limited gene flow among the temporal spawning runs.

Nielsen et al. (1999) concluded that additional sampling is needed to test for significant genetic differences among natural spawning and hatchery populations of fall-run chinook salmon. A sample of chinook salmon from Guadalupe River showed significant haplotype frequency differences from samples of the four spawning runs in the Central Valley, primarily due to a

haplotype (CH9) found in 2 fish in the Guadalupe River. This haplotype has not been observed in fish from the Central Valley but has been found in samples of Russian River chinook salmon. The remaining 27 samples from the Guadalupe River could not be differentiated from the chinook salmon in the Merced and Feather River hatcheries through the use of mtDNA." (pages 50,400-401)

"The status of chinook salmon spawning in tributaries to San Francisco Bay was also considered. The presence of chinook salmon adults and juveniles (including observed spawning activities) has been recorded in a number of rivers and creeks draining into San Francisco Bay (Leidy, 1984; Myers et al., 1998; San Francisco Estuary Project, 1998; Jones, 1999, unpubl. data). However, NMFS was unable to establish if any of these populations were self-sustaining. Although the historical relationship between chinook salmon spawning in San Francisco Bay tributaries and the coastal and Central Valley Evolutionarily Significant Units (ESUs) is not known, present day adults may have originated from the numerous off-site releases of Central Valley hatchery fall-run chinook salmon into the delta or San Francisco Bay. Additional information on genetic and life history traits for San Francisco Bay chinook salmon and their relationships with Central Valley and coastal chinook salmon populations is necessary to resolve this issue." (page 50,402)

Documentary References and Oral Statements

Compiled below are documentary references and oral statements by local fishermen concerning the historical occurrence of Chinook salmon in Santa Clara streams. WMI members disagree whether this information demonstrates that Chinook salmon spawned and reared in these streams. Therefore, this Supplementary Information does not interpret the information or express an opinion on its accuracy.

Excerpts from Documentary References

The presence of both Chinook and Coho salmon and steelhead trout in South Bay waterways is referred to in a number of historic accounts.

Ohlone life was busy. They lived in an area with numerous salmon streams and developed a lifestyle to adjust to the salmon seasonality. (Galvan) The early Spanish explorers and missionaries found indigenous people depended heavily on the seasonal rush of fish. "The Ohlone held confidence in catching and preserving enough to last to the next spawning. The favorites and most numerous were the King Salmon, the Silver Salmon and the Steelhead/Rainbow Trout." (Heizer & Elsasser). "The Ohlone found joy and satisfaction with the profusion of salmon in the area. Every tribe north of Monterey used its stream to its advantage during the seasonal salmon runs." (Heizer and Elsasser). The Ohlone trapped trout and salmon in the creeks and ponds of the hills at the end of the season. In some cases the Ohlone would dam the creeks, toss soaproot and mashed buckeye in to stun the fish. The fish would rise to the surface and the Natives could catch & eat them (Margolin). More often, the principal method of catching fish was with nets, the effectiveness of this method is reported in personal journals of visitors (Heizer). (A1)

The Indians of Santa Clara Valley had a great abundance of food. The creeks or rivers, many now no longer extant, ran year-round all teaming with trout, steelhead and salmon. Trips to Alviso Bay, Pescadero or Santa Cruz provide clams, mussels and wild duck. (A2)

The Mission has an abundance of water obtained from the River of Nuestra Senora de Guadalupe which is about a quarter league distance from the houses. In this river good trout are caught in the summer. The Thamien-Socoistaca site at the confluence of the surface arroyo and the Rio Guadalupe was a hillock of laurel trees, tall & straight at hand for building. The Mission Creek, with its ready supply of surface water for cooking and cleaning, was attractive at any point. In the full but not yet overflowing Rio Guadalupe, there were salmon for the fishermen. (A3)

Anadromous fish were an important part of aboriginal subsistence economies in northern Native California. Of the five species of Pacific salmon the two most abundant in the freshwater systems of Northern California were the Chinook and silver or Coho. Chinook are normally more prevalent in larger rivers while the Coho frequents smaller streams. In addition to these salmon species, large populations of steelhead are seasonally common in nearly all coastal streams of California. The king and silver salmon entered the rivers and streams in the latter half of the year and the king salmon also entered the larger rivers in the spring, creating an important spring-fall cycle of runs. Chinook ranged as an important resource as far south as Monterey Bay and could be found in smaller numbers as far south as the Ventura River. (A4)

King, Chinook or Quinnant salmon run in the spring and fall, Silver or Coho Salmon and Chum or Dog salmon run in the fall. Every Northern California stream of whatever kind has more or less of these fall run salmon. The southern limit for Chinook salmon is the Ventura River. The flesh of spring run fish is pink and the fall run white which makes fall run fish pretty much worthless for canning. It is not generally possible to capture any species in large numbers until they enter the rivers and streams. (A5)

"Quinnant or Chinook Salmon Range from Alaska to California, southward to the Ventura River, ascending all large streams and are especially abundant in the Columbia and Sacramento Rivers." "Dog Salmon ranges from Kamchatka to San Francisco Bay ascending all streams in the fall and spawning no great distance from the sea." Silver or Coho salmon are abundant from San Francisco Bay to Alaska ascending small streams in the fall to no great distance." (A6)

Historical migration routes for salmon and steelhead are shown leading to the South Bay. Most South Bay streams, including the Guadalupe River, Los Gatos Creek, Stevens Creek and Coyote Creek are shown as Silver salmon and steelhead streams. (A7)

1890 photo of O.A. Hale of San Jose with catch of about 24 salmon. Some salmon identified as probably Chinook by Dr. Stacy K. Li, others believed to be chum or coho salmon. (A8)

San Jose Mercury News article dated March 1988 documents two fishermen fishing for salmon in the Guadalupe River and stated they had been doing so for over a dozen years, (since the mid 1970's). The article also indicates that Linda Ulmer, CA Dept. of Fish & Game biologist stated they had evidence confirming a viable run of salmon and steelhead in the river. (A9)

In August 1994 Alviso residents reported to the San Jose Mercury News that a fish kill had occurred in the Guadalupe River, and that their carcasses were in the vicinity of Alviso. GCRCD and Silichip Chinook reported that the fish kill involved Chinook salmon and occurred in the vicinity of the Route 237 Bridge construction project. This incident was reported in the San Jose Mercury News. The news article states that Dr. Jerry Smith, of San Jose State University, documented Chinook salmon in the Guadalupe River in the mid 1980's. (A10)

On November 27, 2000, Dr. Jerry Smith, San Jose State University, distributed and e-mail stating that "Chinook salmon were reported in San Thomas Aquino Creek in the early 1980's in response to a reported sighting of a possible coho salmon in the creek." Dr. Smith stated that Chinook carcasses were investigated by Dennis Eimoto of the CA Dept of Fish and Game office in Monterey. (A11)

Citations:

A1. "A River Ran Through It. The Cultural Ecology of the Santa Clara Valley Riparian Zone," Erin M. Reilly, Research Manuscript Series No. 3, Dept. of Anthropology and Sociology, Santa Clara University, Santa Clara, CA, 1994.

A2. "Lo, the Poor Indian" of the Santa Clara Valley, Ralph Rambo, Historical Booklet, University of Santa Clara, Santa Clara, CA Orrandre Library, 1967

A3. "The Five Franciscan Churches of Mission Santa Clara 1777 to 1825," Arthur Dunning Spearman, S. J., National Press, University of Santa Clara, Santa Clara , CA

A4. "Ritual Management of Salmonid Fish Resources in California," Sean L. Swezey & Robert F. Heizer, The Journal of California Anthropology

A5. "Salmon and Trout of the Pacific Coast" Dr. David Starr Jordan, President Stanford Univer-sity, Thirteenth Biennial Report of the State Board of Fish Commissioners of California for 1893.

A6. "Fishes of North America," Jordan and Evermann, Bulletin 47, United States National Museum.

A7. "Fish and Wildlife Resources of the San Francisco Bay Area", John B. Skinner, CA Dept. of Fish & Game, 1962.

A8. "San Jose, California's First City," E. Beilharz and D.O. DeMers Jr.

A9. "Fish Discovery Spawns Protest," Pat Dillon, San Jose Mercury News, March 18, 1988.

A10. "Pipes Trap Salmon, Construction Crew's Pipes Trap, Kill Salmon in River," San Jose Mercury News, September 3, 1994.

A11. E-mail letter to Distribution from Dr. Jerry Smith, San Jose State University, Nov. 27, 2000.

Fishermen's Oral Statements

Numerous long-time fishermen and other residents in the South Bay area also provide accounts of observing and catching all three species of fish, chinook and coho salmon and steelhead trout, in south bay waters from the early 1900's until the 1970's. A number of these men also provided accountings from the late 1800's from their grandfathers. From the 1980's until the present day, Chinook salmon and steelhead trout have be observed, captured and photographed in major South Bay waterways, in increasing numbers over the past ten years.

Mr. & Mrs. Joseph Altieri long time area residents reported seeing salmon behind their home on Los Gatos Creek during most wet years for at least the past 30 years. (B1)

Mr. Kenneth Anderson, long time resident and fisherman stated that he observed steelhead trout and silver salmon in the Guadalupe River for many years and used to catch loads of steelhead in his younger days. " He indicated that the steelhead were so plentiful you could almost walk across the river on their backs." Mr. Anderson provided the Natural Heritage Institute a written deposition on these facts in support of the South Bay Salmon & Steelhead Restoration Coalition's legal actions. (B2)

Sandy Christiansen, long time resident on St. John Street, San Jose stated he has observed salmon and steelhead, from the windows of his home, in the Guadalupe River for as long as he can remember as they migrated upstream and spawned in the area. (B3)

Brian Collins, a long time resident of the area stated that he and his friends would go down to Los Gatos Creek when he was attending Del Mar High School in the 1970's and observed and caught spawning salmon in the fall with his bare hands. (B4)

Frank Cucuzza long time resident of the area and avid fisherman stated he could remember catching steelhead in the Guadalupe River as a little boy and throughout his young adult life. He stated he had also observed spawning salmon in Los Gatos Creek from the deck of his home on the creek for many years. Mr. Cucuzza reported he caught several steelhead just above the Taylor Street Bridge several years ago in the same location he used to fish as a boy. Frank serves on one of the SCVWD's Flood Control Zone Planning Committees. (B5)

Mr. George Garbarino, 85 year old resident and fisherman of San Jose lived in a house next to the Guadalupe River and owned and operated a Machine Shop on Los Gatos Creek. Mr. Garbarino stated he caught loads of silver salmon and steelhead trout in Los Gatos Creek, just behind his business from the 20's to the 60's and continued catching steelhead until several years ago when mobility problems kept him off of the creek's steep banks. He stated he observed Chinook salmon in the Guadalupe River over this time period and they seemed to prefer the larger river. He indicated that in his younger days he would sometimes use a pitchfork to collect salmon out of the creek. Mr. Garbarino provided the Natural Heritage Institute a written deposition on these facts. (B6)

Bud Heft, long time resident reported that he observed steelhead in the Guadalupe River for as long as he could remember. (B7)

Mr. George Kasper, long term San Jose resident and avid fisherman, stated he was a member of San Jose Flycasters and fished the Guadalupe River watershed all of his life, as did his father and grandfather. He stated his grandfather and father used to catch Chinook, coho and steelhead in the river when they were young. In the 1930's his father continued to catch these species after he returned from World War II, although in lesser quantities. Mr. Kasper stated that he caught silver salmon in the upper watershed when he was younger and still fishes for and catches trout. He stated that he used to net salmon and steelhead at the base of the dam behind the Santa Clara Valley Water District offices, upstream of Blossom Hill Road, before the fish ladder was installed and released them above the dam. Mr. Kasper indicated his father used to keep detailed records of the fish he caught and indicated that he would try to locate them. (B-8)

Mr. Ken Lawrence, long-term area resident and fisherman, stated he fished the Guadalupe River for steelhead thirty to forty years ago. He is a retired local police officer and currently sits on the Board of the CA Dept. of Fish & Game. He indicated he recalls seeing his father, who just passed away, catching salmon in the Guadalupe River when he was very young. (B9)

Mr. N. Morano, long time area resident on St. John Street reported observing large salmon in the Guadalupe River system for many years, at least since the early 1970's, although he was not able to identify if they were Chinook or Coho. (B10)

Robert von Raesfeld, long time resident, attorney and well known fly fishing instructor, stated his family came to the San Jose area in the 1800's and his father and grandfather were also both avid fishermen. He learned to fish from his father who in turn learned from his grandfather. When he was young his family lived near the Guadalupe River at Vermont and Chestnut Streets. He said most South Bay waterways had salmon and steelhead runs. He said his father taught him how to distinguish between Coho and Chinook salmon (black versus light gums and the number of rays on the anal fin). He said that the Guadalupe River had runs of both coho and Chinook salmon and that he frequently caught 20 pound Chinook salmon in the 40's and early 50's from Taylor Street all the way up to the Almaden area. He used to fish the area waters intensely all the way down to Morgan Hill where he now resides and every vacation he took was a fishing vacation. He indicated his father told him many stories of catching loads of salmon in the 20's and 30's and that they were so plentiful that people used to either pitch fork or shovel them out of the river and load them in sacks for fruit tree fertilizer. (B11)

Mr. Clyde L. Ritchie, 80-year-old resident, indicated his family came to the area from Italy and first lived in Woodside. He used to fish the area waters extensively and all of the area streams had steelhead and salmon runs. He used to catch steelhead and silver salmon in San Francisquito Creek and the Guadalupe River System in the 30's and 40's. He said that the Guadalupe River also had runs of Chinook salmon that were very large in wet years. (B12)

Paul Stark stated that his grandfather, John DeBona, a long time resident and retired area sheriff's officer, now living in Eugene Oregon, used to tell him about the large runs of salmon in

the South Bay waterways back in the 20's & 30's. He recalls the numerous photos his grandfather showed him of the fish. He said that they were so plentiful that people used to pitch fork them out of the waterways. (B13)

Mr. Mike Trojan, Alviso resident and retired commercial fisherman, and other long time local residents of Alviso interviewed by the GCRCD and Silichip Chinook indicated they had knowledge of salmon migrating through Alviso Slough in the August/September time frame almost every year for as long as they could remember. (B14)

Citations:

B1. Altieri, Joseph, 1280 Dr., San Jose, CA, personal conversations and meetings with L.M. Johmann, (GCRCD) 1995, 1996.

B2. Anderson, Ken, San Jose, personal meetings and conversations with L.M. Johmann (GCRCD) 1995. Interview and deposition with NHI attorney, M. Wolfe, 1996.

B3. Christiansen, St. John Street, San Jose, CA, personal conversations and meetings with L.M. Johmann, R. Castillo, 1994, 1995, 1996, 1997 & GCRCD Board of Directors, 1995.

B4. Collins, Brian, Campbell, CA, personal meeting with L.M. Johmann (GCRCD) 1996.

B5. Cucuzza, Frank, 1309 Glen Eyrie Ave. San Jose, personal conversations and meetings with L. M. Johmann & R. Castillo, (GCRCD) 1995, 1996, 1997, 1998.

B6. Garbarino, George, 34 Autumn Street, San Jose, (business address) personal conversations and meetings with L. M. Johmann and R. Castillo 1996, 1997. Interview and deposition with the GCRCD Board members and NHI attorney, M. Wolfe, 1996.

B7. Heft, Bud, Ironwood Court, San Jose, personal conversations and meetings with L.M. Johmann and R. Castillo 1995.

B8. Kasper, George, San Jose, personal conversation with L.M. Johmann (GCRCD), Nov 4, 2001.

B9. Lawrence, Ken, San Jose, personal conversations with L.M. Johmann (GCRCD) 1996.
B10. Morano, N, St John St., San Jose, personal meetings and conversation with L.M. Johmann (GCRCD), 1995

B11. Von Raesfield, Robert, 900 Lafayette St. Suite 706, Santa Clara, CA, personal conversation with L.M. Johmann (GCRCD), 2000.

B12. Ritchie, Clyde, 1448 Willowmont Ave. San Jose, personal conversation with L.M. Johmann (GCRCD), 2000.

B13. Stark, Paul, San Jose, personal meetings and conversations with Roger Castillo and L.M. Johmann, from 1990 to 2000.

B14. Trojan, Mike and other Alviso residents interviewed by the GCRCD, Silichip Chinook and the San Jose Mercury News, September 1994.

Origins of Chum Salmon

Table 7-4b, “Current Freshwater Fishes Observed in Santa Clara Basin Watersheds” is amended to delete the “I” for “Introduced Species” in the origin column for chum salmon and replace it with a footnote 6, which states: "Native to California, but origins of individuals observed in the Guadalupe River in recent years is unknown.”